

**Lower Passaic River Study Area PWCM QAPP Revision
Response to EPA Comments**

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PREPARED AT REQUEST OF COUNSEL- PRELIMINARY DRAFT
FOR DISCUSSION PURPOSES ONLY

No.	Section/Title	Comment	Response
1		Throughout the document and associated attachments/appendices, it is stated that the physical water column monitoring (PWCM) program will consist of two three-month deployments, which will each include four boat-based transect surveys; however, the Fall 2009 deployment was cut short by a month and only 3 boat-based surveys were completed, over a period of 2 months (mid-October to mid-December). The text and supporting tables, attachments/ appendices should be revised accordingly. In addition, any text pertaining to the total number of samples proposed for collection during both field deployments should be changed to reflect one two-month deployment (Fall 2009) and one three month deployment (Spring 2010).	The QAPP will include the suggested revisions.

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2		<p>Although you have made several presentations to us about replacing the organic carbon portion of the integrated hydrodynamic, sediment transport, organic fate and transport, and contaminant fate and transport model with the use of observed data, we have not yet received a written request from you with details on the proposal for our review and approval. However, if you are still planning to proceed down this path, then we believe that additional measurements of particulate organic carbon (POC) and dissolved organic carbon (DOC) should be added to the field monitoring program. In particular, under the current water column monitoring plan, there are no plans to obtain measurements of POC or DOC above Dundee Dam or in the tributaries. At a minimum, for every discrete measurement of suspended solids concentration (SSC), there should be a corresponding measurement of POC and DOC for the Dundee Dam and tributary stations. We also believe that additional measurements of POC and DOC should be taken at the Acoustic Doppler Current Profiler (ADCP) deployments in the LPR, Newark Bay, and the Kills. The current monitoring plan calls for taking near-surface and near-bottom grab samples for SSC analysis at three locations across the width of the River, Bay, or Kills at each ADCP deployment. However, analysis for POC and DOC would only be performed at one of these three locations (the location associated with the near-surface and near-bottom waters closest to the ADCP device). We recommend that if samples are not analyzed for POC and DOC at all three locations, then the samples associated with the location closest to the ADCP (i.e., the current plan) and the location furthest away from the ADCP mooring should be analyzed for POC and DOC.</p>	<p>The PWCM program carried out during fall 2009 measured POC and DOC at a number of locations, including above Dundee Dam. The wet weather sampling to be performed in the spring will be expanded to include collection of POC/DOC along with SSC samples, as recommended. It is further contemplated that additional POC/DOC will also be collected during the upcoming CWCM program if data gaps from the PWCM are identified.</p> <p>Analysis of the DOC and POC data suggests that organic carbon in the Passaic is dominated by loadings from upstream of Dundee Dam. Therefore, POC and DOC are not expected to show any systematic gradients across a transect. Without fully understanding the Data Use Objectives to support the request for additional POC/DOC data along each transect, these additional data do not appear to be necessary.</p>

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3		EPA will be taking split samples for the upcoming sampling events. When collecting split samples for SSC and for POC/DOC, it is recommended that each sample carboy be filled directly from the pump/tubing sampling system, rather than filling a sampling carboy and then splitting the sample into two smaller carboys. The concern with the latter approach is that some of the heavier solids might settle to the bottom of the larger container and not be transferred to one of the split sample carboys. As such, we request the use of sample tubing “splitters” during the aqueous sample collection program.	Split tubing will be provided.
4		As we have discussed, long-term wind analysis in the NY area (1960-1990) indicates distinctive seasonal wind patterns. Wind data observed at Central Park shows NW-N winds in winter months and SW-S winds in summer months (see attached sample plots; the analysis was conducted by the Natural Resources Conservation Service -USDA National Water and Climate Center. For detailed information about this analysis, review http://www.wcc.nrcs.usda.gov/climate/windrose.html). Wind-induced waves in the Newark Bay would be generated by persistent winds blowing either from NE or SW directions, which would be blowing along the major axis of the bay. Therefore, the wave monitors should either be left in Newark Bay through the summer, or the deployment should be better planned to capture the anticipated wind conditions. It is also recommended that two wave instruments be deployed in Newark Bay in order to get a more reliable data set for evaluating the presence of waves and wave heights.	<p>There appears to be very limited or no correlation between wind and TSS concentration based on a review of TSS data from northern end of Newark Bay. It is apparent that TSS concentrations in Newark Bay are mainly associated with the tidal range variability and high flow events in the Passaic River.</p> <p>The CPG acknowledges the seasonal variability in wind direction and its influence on wave generation in Newark Bay. . Wind direction, speed and duration will be monitored during the three month deployment. The wave gage data are to be used to calibrate the wave model and, as such, it is only necessary to get the full range of wind directions and a representative range of wind speeds – which is expected to be fulfilled during the 3-month deployment. Sediment transport is influenced by wind speed, rather than the wind direction and higher wind velocities are generally observed during the spring compared to the summer.</p>

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			The CPG believes that the data use objective of providing calibration data for the LPR/NB Model will be met by a single wave gage in Newark

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5		<p>A reconnaissance of Newark Bay was conducted several weeks ago now, and we understand that some of the proposed locations will be moved. In the meantime, here are comments on the proposed locations:</p> <ul style="list-style-type: none"> • Although the locations for the moorings for the Kill Van Kull (KVK) and Arthur Kill (AK) are well suited for providing current speed and direction for calibrating the hydrodynamic model, they are not well suited for providing boundary condition information for SSC and POC/DOC. These data should be obtained closer to the confluence of the KVK and the Hudson River for the KVK and closer to the confluence of the AK and Raritan River/Raritan Bay for the AK. • It is surprising that given the heavy deep-draft shipping that takes place in the KVK that the ADCP mooring for the KVK is being located near the center of the channel as opposed to closer to either of the channel edges. Perhaps this should be reviewed with Dr. Chant of Rutgers University. 	<p>Review of Chant's data at the KVK station showed significant problems with SSC measurements due to ship-generated waves in this area. The CPG does not anticipate that SSC measurements to be different if measured at the proposed KVK location versus the confluence of the KVK with the Hudson River. Further, based on the experience of the OSI field crew in the Newark Bay area, the proposed mooring locations were selected for safety of the instruments and the servicing vessels relative to shipping. Moving the mooring locations may increase the risk of ship damage to the moorings or conflicts during servicing. The CPG believe that the proposed location avoids this issue; nonetheless, it will be difficult to find any location that will be free of this problem.</p> <p>The CPG planned, as part of the model development, to define the model boundary condition at the confluence with the Hudson for the KVK and the Raritan for the Arthur Kill and use the proposed sampling locations in the QAPP as calibration points. The CPG does not see any advantage to EPA's proposal for measuring at the confluences</p>

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6		As is stated on Page 11 of Worksheet 9, EPA agrees that settling velocity and grain size measurements were not to be included in this first draft of the revised QAPP. However, during the meeting on October 21st we also agreed to review results from the recent sampling that was conducted as part of the Removal Action effort, and to reconvene to discuss the possibility of including these measurements in the spring event. The results were recently posted to Premis, and we should schedule a meeting to discuss this issue in late January or early February.	The CPG agrees that these issues should be further discussed.
7		We understand you are still receiving and reviewing data from the fall event. However, what's the status of your review of the Chant and Sommerfield data, particularly in relation to the determination of whether another low flow event is needed in NB?	Chant and Sommerfield data indicate that SSC in Newark Bay is influenced mainly by tidal range and high-flow events in the Passaic. Under low-flow conditions in the Passaic, SSC in Newark Bay seems to be a function of the tidal range. Only when the Passaic River discharge is in excess of ~2000 cfs are SSC concentrations in Newark Bay affected by solids influx from the Passaic River based on observations at the northern end of Newark Bay. Therefore, the low flow conditions that the CPG targeted to define the upstream location of the salt wedge in the Passaic are not required to understand the SSC conditions in NB during low flow (or only influenced by the tide). The combination of Chant's data and the Spring deployment are expected to provide sufficient data for purposes of system understanding, and model calibration/validation in Newark Bay.
8	Introduction Page 4, 4th Bullet	Change third River to Third River.	The comment has been incorporated into the revised document.

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9	WS 5	Under USEPA Oversight Contractor, replace MPI with Louis Berger and CDM. Louis Berger will perform oversight of the NB activities and CDM will perform oversight of the LPR activities.	The comment has been incorporated into the revised document.															
10	WS 9 Page 10	Stephanie Vaughn is listed twice.	The comment has been incorporated into the revised document.															
11	WS 12 and WS 20	<p>These worksheets state that PE samples will be used if a suitable sample is identified. Please state whether or not they will be included. If PE samples will not be evaluated, then verify that the CPG laboratory is NELAC certified and identify the PE sample used to obtain certification.</p>	<p>PE samples are available for Dissolved Organic Carbon and Total Suspended Solids; a PE sample study is not planned. CAS holds NELAP certification and has participated in ongoing performance evaluation studies as a requirement of that certification. As part of the required qualification package for this work the laboratory submitted both Water Pollution and Water Supply performance results from 2008 and 2009; all performance evaluation samples for these programs were provided by Wibby Environmental of Golden, CO. A summary of the results most pertinent to this program are provided below:</p> <table><tr><th>Study No.</th><th>Date</th><th>Analyte</th><th>Lot #</th><th>Result</th></tr><tr><td>WP 078</td><td>July-September 2008</td><td>TOC</td><td>Demand PT-DEM-WP, Lot 8076-07</td><td>Acceptable</td></tr><tr><td>WP 078</td><td>July-September 2008</td><td>TSS</td><td>Solids PT-SOL-WP, Lot 8076-09</td><td>Acceptable</td></tr></table>	Study No.	Date	Analyte	Lot #	Result	WP 078	July-September 2008	TOC	Demand PT-DEM-WP, Lot 8076-07	Acceptable	WP 078	July-September 2008	TSS	Solids PT-SOL-WP, Lot 8076-09	Acceptable
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			WP 0109	January- February 2009	TOC	Demand PT DEM- WP, Lot 8082-07	Acceptable
			WP 0109	January- February 2009	TSS	Solids PT-SOL- WP, Lot 8082- 09D	Acceptable
			WS 0109	January – February 2009	TOC	Total and Dissolved Carbon PT-TOC- WS, Lot No.9035- 12	Acceptable
			WS 0109	January – February 2009	DOC	Total and Dissolved Carbon PT-TOC- WS, Lot No.9035- 12	Acceptable
			The text of Worksheets 12 and 20 has been updated.				
12	WS 12 Page 3	The last column on the DOC page should have an “A” not an “S & A” for the MS/MSD sample.	The comment has been incorporated into the revised document.				

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13	WS 16	<p>a. Page 1: Table needs to be revised per General Comment 1, above. Under the column title “Anticipated Date of Completion” change January 2010 to December 2009; row seven change “servicing of meters” to retrieval of meters or equivalent to indicate the meters were pulled; and line nine should be removed as the fourth boat-based survey was not performed.</p> <p>b. The recon on NB was done more than 2 weeks ago but the deliverable has not yet been provided as indicated in this table. Please update the table or provide the deliverable.</p> <p>c. The header in the upper right hand corner of the first page is incorrectly labeled “Worksheet #15.</p> <p>d. The repeated use of first, second, third, and fourth boat-based survey is confusing. Please go through the table and clarify the language.</p> <p>e. Page 2: The worksheet states that there is no deliverable associated with laboratory analysis. However, the data is supposed to be submitted on an ongoing basis with the monthly progress reports.</p>	<p>a- These comments have been incorporated into the revised document.</p> <p>b-A memorandum providing the results of the recon visit as well as recommendations to improve the field program is being prepared. The text has been modified.</p> <p>c – Comment has been incorporated into the revised document.</p> <p>d – Comment has been incorporated into the revised document.</p> <p>e– The text has been updated to state that data is provided with the monthly progress report on an ongoing basis.</p>
14	WS 17	<p>a. Page 3: Under “Full Period Deployed Meters” change RM 4.3 to 4.2, based on Field Modification Number PWCM 02 dated October 11, 2009.</p> <p>b. Page 4: The last paragraph of this page states that the relationship between SSC and OBS will be evaluated for usability. How will usability be determined?</p> <p>c. Page 4: Under Boat-based Transect Surveys, 1st paragraph, 7th line, this sentence seems to indicate that 2 rounds of transect surveys will only be done for 5 locations in LPR. How many will be done in NB? Clarify text.</p>	<p>a – Changes have been made to the document.</p> <p>b –The data will be examined for a linear relationship. The text has been changed to reflect this.</p> <p>c – Transect surveys will be completed in Newark Bay during the spring deployment only. Text has been clarified as requested.</p>

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15	WS 18	<p>a. Pages 1 to 5: This table indicates 2 transects/survey for NB, but this is not clear in the text of WS #17. Clarify the text and/or fix the table, as appropriate.</p> <p>b. Some of the Newark Bay sampling locations (e.g., Newark Bay South, Boat-based service, SSC) indicate two deployment events – is this correct? Please reorganize QAPP Worksheet #18 to differentiate work completed in 2009 from work proposed for 2010 to help clarify the future number of surveys and samples to be collected.</p>	<p>a– Five locations within Newark Bay are planned. Text has been clarified in WS #17 and #18.</p> <p>b- Consistent with the introduction, one survey is planned for Newark Bay. This includes a 3 month deployment with monthly servicing of instruments. Transect surveys will be conducted in conjunction with the beginning of the deployment, the two interim servicing visits and the end of the deployment. Text has been updated appropriately.</p>
16	WS 19 and SOP LPR-F1-02	<p>Attachment 1 states that the POC/DOC samples will be collected in triplicate (three 0.2 liter bottles). It is not clear from the worksheet or the SOP how these bottles will be used. Please clarify.</p>	<p>Three replicate filters are prepared for each sample by filtering each sample volume collected. Three separate bottles are used so that each replicate analysis uses the entire sample rather than mixing a larger bottle and subaliquoting. Samples with large amounts of suspended solids tend to settle out too quickly creating aliquots with less suspended solid material in the initial subsample and increasingly more with each successive subaliquot. A footnote has been added to clarify.</p>
17	WS 20	<p>See previous comment on WS 12. In addition, change text in Footnote C to field “replicates” instead of “duplicates,” to be consistent with the corresponding column heading, “No. of Field Replicates.”</p>	<p>Comment has been incorporated into the revised document.</p>
18	WS 27	<p>a. Pages 2 to 3: The 2nd bullet (...-T2BT" should be "...-P2BT"?) and 4th bullet ("10A-T2R0-P1--E02-AS" should be "10A-E02--T2R0-P1AS"?) seem to have errors. Also, the 4th bullet should be further clarified as to what the T2R0 means.</p> <p>b. Page 3: In the first bullet, change “lef-most” to “left-most.”</p>	<p>Comment has been incorporated into the revised document.</p>

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19	WS 28	Equipment rinsate blanks are listed on WS 20. For completeness, they should be included on this worksheet as well.	Noted, rinsate blank information has been added to Worksheet 28.
20	WS 29	a. Page 1: The text notes regular reporting through the LPR monthly progress reports. Will the NB information be included in these reports, or will it be provided to Tierra to submit in their monthly progress reports? b. Page 2: The first bullet notes that a tech memo will be prepared. Will this include the data, summaries, and evaluations for NB and LPR?	a- The LPR and NB information will be included in the monthly reports from the CPG. The text has been changed to reflect this comment. b- The LPR and NB information will be included in the monthly reports from the CPG.
21	WS 31	A Safety Audit was not conducted during the first week of the Fall 2009 deployment, but was conducted during the second deployment in November. Please revise text.	Field modifications, which are attached to this response for clarification, have documented this change in scheduled audit time. The text has been changed.
22	WS 35 Page 2	Prior to reducing the validation efforts, please review the validation findings from the first two SDGs with EPA.	This approach was used on the LRC Program. The approach can be reviewed with EPA; however validation of the October and November sampling events has been completed.
23	Attachment 1	a. Page 2, Third paragraph, last sentence: Please clarify how the data was determined to be of "high quality." b. Page 4: Update the 3rd full paragraph with information on the spring program in NB. c. Table 4: The table seems to include information related to both LPR and NB. If so, please revise the title accordingly.	a – Data were reviewed for completeness and values were within appropriate ranges. The text has been changed. b – The secondary data review is intended to provide the basis for the proposed scope by building on what has been done. The proposed text addition is not appropriate for this text. c- Comment incorporated.
24	Attachment 2, Pages 2, 4, and 8	Steps 1, 4, and 5 of DQO 1 and Steps 3 and 4 of DQO 2 seem to still have wording from the previous PWCM, and do not include the NB spring sampling. Please update the text.	The text has been updated, where appropriate.

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25	Appendix A	<p>a. Page 3, Second bullet: The text describes “two three-month deployments in the LPRSA” for data collection. Please clarify – we understand that the March 2010 event will be the second deployment for the Passaic River, but only one deployment is currently planned in Spring 2010 for Newark Bay.</p> <p>b. Pages 9 and 10: Sections 3 and 4 need to be updated to include the NB spring sampling (for example, 11 meters will be deployed, not 6), and also to reflect changes due to Comment 20 above.</p>	<p>a – The text has been updated.</p> <p>b – The text has been updated.</p>
26	Appendix C SOP L-66	<p>a. We reviewed the CPG response to Comment 25 on the original PWCM QAPP (submitted by letter dated September 28, 2009). The response to concern over high bias due to salinity included the following statement: In addition it has been suggested that rinsing with additional volumes of reagent water can be helpful in overcoming the bias associated with the glass fiber filter; additional rinses are part of the laboratory SOP (Paragraph 11.5.4.4).” While this statement is true and the SOP states to repeat the rinse step with two or more aliquots of reagent water, it is not clear that how the analysts will be made aware of this requirement exists and that these additional rinse steps will be appropriately conducted. Please clarify how you will assure that this requirement will be met by the lab.</p> <p>b. The analytical SOP for ASTM D-3997-97 allows for variation in sample settling time and subsequent actions/reporting. Please specify the particular implementation of ASTM D-3997-97 to be used to provide for consistency in government split sample analysis, and proper interpretation of the results.</p>	<p>a-This analysis is being performed by the laboratory supervisor who wrote the SOP; the additional rinse steps are being consistently used. The laboratory has agreed to modify the bench sheet which is included in the data package to document the rinse procedure.</p> <p>b- Test Method B of ASTM-3977 has been used in this program. The SOP prepared by the lab includes options A, B, and C just as in the ASTM method.</p>